

What is claimed is:

1. A process for preparing trioxane from aqueous formaldehyde solutions in the presence of acidic catalysts in a reaction column equipped with a circulation evaporator, which comprises mixing the formaldehyde solution used as a starting solution with a sidestream from the bottom of the reaction column and feeding it to the upper section of the reaction column via a tubular reactor.
2. The process as claimed in claim 1, wherein the ratio of the volume per unit time of fresh formaldehyde solution fed to the tubular reactor and the volume per unit time from the bottom of the reaction column fed to the tubular reactor is between 0.5 and 20, preferably between 1 and 10 and more preferably between 2 and 5.
3. The process as claimed in claim 1, wherein the volume of the reaction column is greater than the column bottom volume.
4. The process as claimed in claim 1, wherein the average residence time in the tubular reactor is between 1 min and 20 min, preferably between 2 min and 10 min.
5. The process as claimed in claim 1, wherein the concentration of acidic catalyst is below 2% by weight.
6. The process claim 1, wherein the pressure in the reaction column is above atmospheric pressure and preferably from 1.5 to 2.5 bar_{abs}.
7. The process as claimed in claim 1, wherein some or all of the formaldehyde vapor with which the lower section of the column is charged stems from separate sources.
8. The process as claimed in claim 1, wherein the catalyst used is a strongly acidic ion exchanger.
9. An apparatus for carrying out the process as claimed in claim 1, comprising
 - i) a reaction column (A),

- ii) a bottom stream draw line which opens into
- iii) a circulation evaporator (B) and feeds to it a portion of the bottom stream, and
- iv) a draw line for the vapor mixture generated leads from the circulation evaporator into the lower section of the reaction column,
- 5 v) a draw line for the branching-off of a portion of the bottom stream leads from draw line ii) before it opens into the circulation evaporator (B) and,
- vi) together with a feed line for fresh formaldehyde solution, opens into
- 10 vii) a tubular reactor (D) which opens via a draw line
- viii) into the upper section of the reaction column (A).

10. The apparatus as claimed in claim 9, wherein a pump (C) is provided, with which a portion of the bottom stream and of the fresh formaldehyde solution is fed via the tubular reactor (D) to the upper section of the reaction column (A).

15

11. The apparatus as claimed in claim 9, wherein at least one feed line is provided, with which the formaldehyde-containing vapor which does not stem from the circulation evaporator (B) can be fed to the lower section of the reaction column (A).

20